Munich Cancer Registry

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ICD-10 C01-C06: Oral region cancer

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	4,580
Diseases	4,659
Creation date	12/20/2021
Database export	12/20/2021
Population	4.95 m

Munich Cancer Registry
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https://www.tumorregister-muenchen.de/en

https://www.tumorregister-muenchen.de/en/facts/base/bC0106E-ICD-10-C01-C06-Oral-region-cancer-incidence-and-mortality.pdf

Index of figures and tables

Global Statements about the statistics on the Internet −
Baseline Statistics (grey button), **Survival** (red button)

In these analyses, the clinics and physicians of Upper Bavaria and the city and county of Landshut[#], with a total of 4.69 million inhabitants, account for the frequency of cancer diseases[##] and the achieved long term results. Additionally, the long term survival evaluated by the Munich Cancer Registry (MCR) is compared with the results of the population-based registry in the USA (SEER), which is useful for checking the consistency of the data on an international level.

In comparing several tables, inconsistent figures may be detected. This is based on the fact that different patient cohorts are included in the base calculation, for example when proportions of multiple tumors or DCO-cases[###] are concerned. In other cases the individual tumor diagnosis is the basis for calculation, for example with incidence.

The foot notes describe the currentness of the data. The baseline statistics and survival data are updated annually. This yearly analysis comprises the Annual Report of the MCR.

Clinics and physicians have access to essentially more detailed data, with which they can check, compare and in the best case optimize their own data and results.

We would be pleased to receive corrections, critique and useful suggestions. Just send an e-mail to tumor@ibe.med.uni-muenchen.de.

Munich Cancer Registry, December 2021

[#] Base data has been collected since 1998. An increase in new diseases is apparent, which is an effect of two extensions in the MCR catchment area (from a base population of 2.65 million to 4.10 in 2002, and to 4.69 million in 2007).

[##] Due to the high frequency and good prognosis of non-malignant skin cancer (C44), no systematic ascertainment is performed for this diagnosis. C44 is not designated as a primary, but rather as a secondary tumor.

[###] DCO (death certificate only) identifies a cancer case that first becomes available to the MCR through the death certificate.

Some remarks regarding this cancer type

As a general rule, these few results from the TRM form the basis of sophisticated analyses. For head and neck tumors this is not the case. Therefore the results for head and neck tumors should be interpreted with caution. In part this is due to problems of classification because of limited specific details of locality. Additionally, with advanced tumors in a close topographic location it is often not possible to determine the exact ICD localization of a tumor.

ICD-10 codes (ICD-10 2015) used for specifying cancer site

Code	Description
C01	Malignant neoplasm of base of tongue
C02.-	Malignant neoplasm of other and unspecified parts of tongue
C03.-	Malignant neoplasm of gum
C04.-	Malignant neoplasm of floor of mouth
C05.-	Malignant neoplasm of palate
C06.-	Malignant neoplasm of other and unspecified parts of mouth

INCIDENCE

Table 1

Cases with invasive cancer by year of diagnosis, proportions of DCO, further malignancies, deaths, and active follow-up (ALL PATIENTS) (incl. DCO)

Year of diagnosis	All cases n	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	127	7	5.5	14.2	18.9	84.3	99.2
1999	135	6	4.4	14.5	18.8	83.7	96.3
2000	120	6	5.0	12.8	18.5	80.8	98.3
2001	132	8	6.1	12.6	18.5	86.4	98.5
2002	209	12	5.7	13.3	18.1	81.8	98.1 #
2003	221	14	6.3	14.2	18.0	81.4	99.5
2004	227	10	4.4	14.1	17.1	78.0	97.4
2005	190	9	4.7	14.5	16.7	76.8	96.3
2006	218	5	2.3	14.8	16.4	78.4	96.3
2007	262	11	4.2	14.8	15.8	72.9	93.5 #
2008	267	8	3.0	15.4	15.5	73.8	98.1
2009	278	5	1.8	16.1	15.0	68.3	98.6
2010	300	15	5.0	16.1	14.3	69.0	98.7
2011	246	7	2.8	16.6	13.4	59.8	98.0
2012	273	9	3.3	16.9	12.4	56.8	98.2
2013	303	7	2.3	17.2	11.9	59.7	98.3
2014	251	9	3.6	17.6	11.6	56.2	97.2
2015	253	7	2.8	17.7	10.7	54.5	97.2
2016	199	4	2.0	18.1	12.1	49.7	99.5
2017	181	3	1.7	18.7	10.0	41.4	100.0
2018	126	5	4.0	19.1	9.1	37.3	100.0
2019	72	1	1.4	19.2	7.6	43.1	100.0
2020	69	1	1.4	19.5	6.3	30.4	98.6 ##
1998-2020	4659	169	3.6	19.5	18.9	66.5	97.9

4,659 cases diagnosed 1998-2020 are related to a total of 4,580 patients. Currently, in 1,654 (36.1 %) of these 4,580 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 1,214 / 327 / 113 (26.5 % / 7.1 % / 2.5 %) patients exist having 2 / 3 / 4+ malignancies.

The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 126 cases has been diagnosed, of which 19.1 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 9.1 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1a

Cases with invasive cancer by year of diagnosis, proportions of DCO, further malignancies, deaths, and active follow-up (MALES) (incl. DCO)

Year of diagnosis	Males n	Males %	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	86	67.7	5	5.8	16.3	19.3	87.2	98.8
1999	83	61.5	2	2.4	16.0	19.2	85.5	95.2
2000	88	73.3	6	6.8	13.6	18.8	85.2	98.9
2001	92	69.7	6	6.5	13.2	18.9	90.2	98.9
2002	142	67.9	7	4.9	13.4	18.5	83.8	97.2 #
2003	160	72.4	10	6.3	14.9	18.3	82.5	100.0
2004	159	70.0	6	3.8	14.8	17.5	75.5	96.9
2005	128	67.4	5	3.9	15.1	17.0	76.6	96.9
2006	150	68.8	4	2.7	15.3	16.7	85.3	96.7
2007	184	70.2	7	3.8	15.7	16.0	75.0	93.5 #
2008	179	67.0	6	3.4	16.4	15.7	76.0	98.9
2009	181	65.1	3	1.7	17.1	15.2	74.0	98.9
2010	206	68.7	12	5.8	17.3	14.3	70.4	99.0
2011	163	66.3	5	3.1	17.7	13.4	66.3	98.8
2012	183	67.0	7	3.8	18.2	11.8	58.5	98.9
2013	207	68.3	6	2.9	18.2	11.0	62.3	99.0
2014	170	67.7	6	3.5	18.8	10.6	60.0	98.2
2015	172	68.0	6	3.5	19.0	9.2	53.5	96.5
2016	135	67.8	3	2.2	19.5	10.5	48.9	99.3
2017	122	67.4	1	0.8	20.0	7.6	44.3	100.0
2018	77	61.1	2	2.6	20.3	5.7	35.1	100.0
2019	45	62.5			20.4	3.7	53.3	100.0
2020	41	59.4	1	2.4	20.7	2.6	34.1	100.0 ##
1998-2020	3153	67.7	116	3.7	20.7	19.3	69.0	98.1

3,153 cases diagnosed 1998-2020 are related to a total of 3,102 patients. Currently, in 1,168 (37.7 %) of these 3,102 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 850 / 231 / 87 (27.4 % / 7.4 % / 2.8 %) patients exist having 2 / 3 / 4+ malignancies.

The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 77 cases has been diagnosed, of which 20.3 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 5.7 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1b

Cases with invasive cancer by year of diagnosis, proportions of DCO, further malignancies, deaths, and active follow-up (FEMALES)
(incl. DCO)

Year of diagnosis	Females n	Females %	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %	
1998	41	32.3	2	4.9	9.8	17.9	78.0	100.0	
1999	52	38.5	4	7.7	11.8	17.9	80.8	98.1	
2000	32	26.7			11.2	17.7	68.8	96.9	
2001	40	30.3	2	5.0	11.5	17.5	77.5	97.5	
2002	67	32.1	5	7.5	12.9	17.1	77.6	100.0	#
2003	61	27.6	4	6.6	12.6	17.3	78.7	98.4	
2004	68	30.0	4	5.9	12.5	16.4	83.8	98.5	
2005	62	32.6	4	6.5	13.0	16.0	77.4	95.2	
2006	68	31.2	1	1.5	13.6	15.8	63.2	95.6	
2007	78	29.8	4	5.1	12.7	15.4	67.9	93.6	#
2008	88	33.0	2	2.3	13.1	15.0	69.3	96.6	
2009	97	34.9	2	2.1	13.8	14.5	57.7	97.9	
2010	94	31.3	3	3.2	13.6	14.4	66.0	97.9	
2011	83	33.7	2	2.4	14.3	13.4	47.0	96.4	
2012	90	33.0	2	2.2	14.3	13.6	53.3	96.7	
2013	96	31.7	1	1.0	15.0	13.8	54.2	96.9	
2014	81	32.3	3	3.7	14.9	13.7	48.1	95.1	
2015	81	32.0	1	1.2	14.9	13.7	56.8	98.8	
2016	64	32.2	1	1.6	15.2	15.3	51.6	100.0	
2017	59	32.6	2	3.4	16.0	14.3	35.6	100.0	
2018	49	38.9	3	6.1	16.7	14.6	40.8	100.0	
2019	27	37.5	1	3.7	16.6	14.0	25.9	100.0	
2020	28	40.6			17.1	12.5	25.0	96.4	##
1998-2020	1506	32.3	53	3.5	17.1	17.9	61.0	97.5	

1,506 cases diagnosed 1998-2020 are related to a total of 1,478 patients. Currently, in 486 (32.9 %) of these 1,478 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 364 / 96 / 26 (24.6 % / 6.5 % / 1.8 %) patients exist having 2 / 3 / 4+ malignancies.

The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 49 cases has been diagnosed, of which 16.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 14.6 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 2

Incidence measures by year of diagnosis including DCO cases
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	86	41	7.8	3.5	5.3	1.9	7.1	2.7	8.0	3.2
1999	83	52	7.4	4.4	4.8	2.6	6.6	3.5	7.0	3.9
2000	88	32	7.7	2.7	5.2	1.6	7.0	2.2	7.7	2.5
2001	92	40	7.9	3.3	5.1	1.7	7.1	2.5	8.2	2.8
2002	142	67	7.6	3.4	5.0	1.8	6.7	2.6	7.3	3.0
2003	160	61	8.5	3.1	5.6	1.7	7.7	2.4	8.3	2.8
2004	159	68	8.5	3.4	5.4	1.7	7.4	2.4	8.2	3.0
2005	128	62	6.8	3.1	4.3	1.8	5.8	2.4	6.5	2.6
2006	150	68	7.8	3.4	4.9	1.9	6.8	2.6	7.9	3.1
2007	184	78	8.3	3.4	5.2	1.8	7.2	2.5	8.0	3.0
2008	179	88	8.0	3.8	5.0	2.2	6.9	3.0	7.7	3.3
2009	181	97	8.1	4.2	4.9	2.2	6.8	3.1	7.6	3.6
2010	206	94	9.1	4.0	5.6	2.0	7.7	2.8	8.6	3.3
2011	163	83	7.3	3.6	4.3	1.8	6.0	2.5	6.7	2.9
2012	183	90	8.1	3.8	4.8	2.0	6.6	2.8	7.4	3.2
2013	207	96	9.0	4.0	5.3	2.0	7.3	2.8	8.2	3.2
2014	170	81	7.3	3.4	4.4	1.7	6.0	2.4	6.6	2.8
2015	172	81	7.2	3.3	4.1	1.7	5.8	2.4	6.5	2.7
2016	135	64	5.6	2.6	3.2	1.3	4.4	1.8	5.1	2.2
2017	122	59	5.1	2.4	2.7	1.3	3.9	1.7	4.5	1.9
2018	77	49	3.2	2.0	1.8	1.0	2.5	1.4	2.9	1.6
2019	45	27	1.8	1.1	1.0	0.5	1.4	0.8	1.7	0.9
2020	41	28	1.7	1.1	0.9	0.6	1.3	0.8	1.5	0.9
1998-2020	3153	1506	6.8	3.1	4.1	1.6	5.6	2.3	6.3	2.6

The computation of the incidence measures includes all cancers, irrespective of first or subsequent malignancy.

Table 3

Age distribution parameters by year of diagnosis (ALL PATIENTS)
(incl. DCO)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	127	59.0	12.5	0.9	91.4	45.5	50.8	58.2	66.8	76.3
1999	135	60.4	12.3	25.6	95.7	47.1	53.1	59.0	66.8	75.7
2000	120	59.6	11.7	33.5	85.8	45.4	50.6	59.1	68.0	74.7
2001	132	62.5	12.5	33.7	94.3	48.5	53.0	60.8	70.8	79.9
2002	209	61.1	12.4	26.4	99.0	45.5	52.9	60.5	68.3	79.4
2003	221	60.4	11.8	28.1	98.2	46.2	53.1	59.6	66.5	77.1
2004	227	62.0	12.4	26.4	97.9	45.5	54.6	62.0	70.1	78.2
2005	190	61.3	12.8	4.1	98.7	46.1	53.4	61.0	66.9	80.1
2006	218	62.6	13.0	19.0	96.2	47.5	54.2	61.6	71.2	80.7
2007	262	61.9	12.4	26.0	101	46.1	53.7	61.3	70.3	76.9
2008	267	62.4	11.4	21.8	100	49.7	54.0	62.2	69.2	77.5
2009	278	62.8	12.3	29.6	98.4	47.5	54.8	62.6	71.3	79.9
2010	300	62.6	13.0	21.9	92.8	47.2	53.0	61.9	70.8	81.4
2011	246	62.8	13.0	27.0	96.9	47.3	54.1	63.5	72.0	78.3
2012	273	62.7	12.2	21.6	100	48.0	54.3	63.8	71.1	77.4
2013	303	64.1	11.8	28.1	95.5	49.8	56.1	64.0	71.8	79.4
2014	251	63.2	11.4	28.7	93.5	48.9	55.7	63.1	70.9	77.3
2015	253	64.0	11.9	28.5	93.2	50.3	55.7	63.6	72.6	80.3
2016	199	64.3	12.5	21.1	91.3	47.8	55.8	63.9	74.1	79.6
2017	181	66.0	13.0	14.0	96.5	50.9	57.5	66.6	74.6	82.0
2018	126	65.4	11.4	37.6	92.6	51.4	57.7	65.8	72.9	79.0
2019	72	66.8	10.2	50.8	99.0	55.6	59.5	64.6	73.4	79.1
2020	69	66.0	13.1	30.8	93.8	50.2	58.9	64.8	75.1	82.8
1998–2020	4659	62.7	12.3	0.9	101	47.8	54.2	62.2	70.9	78.7

Table 3a

Age distribution parameters by year of diagnosis (MALES)
(incl. DCO)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	86	57.1	11.7	0.9	81.3	45.5	50.8	57.0	62.2	72.2
1999	83	58.5	11.0	33.3	90.8	45.1	52.2	57.9	63.4	72.5
2000	88	58.9	10.7	35.8	85.5	45.7	50.6	58.8	67.5	72.8
2001	92	60.8	12.4	33.7	94.3	46.3	51.3	60.2	65.5	78.6
2002	142	58.8	10.7	26.4	92.2	45.2	51.7	59.7	64.5	71.9
2003	160	59.2	10.1	28.1	86.1	47.3	53.2	59.1	65.2	72.1
2004	159	60.0	11.2	29.7	88.7	45.2	53.3	60.2	66.2	74.7
2005	128	59.8	12.5	4.1	87.1	44.6	52.0	60.4	66.8	77.2
2006	150	61.9	12.0	23.9	92.0	47.4	53.8	60.4	69.4	77.9
2007	184	60.5	11.5	26.0	101	46.0	52.7	59.8	68.1	75.3
2008	179	61.8	10.7	21.8	100	49.7	53.9	61.9	68.3	75.2
2009	181	61.9	11.1	30.2	88.1	47.9	54.5	62.2	69.7	76.2
2010	206	61.0	12.2	24.5	92.8	46.5	52.0	60.1	69.0	76.2
2011	163	61.3	12.2	27.0	93.0	47.1	53.1	60.0	70.2	77.3
2012	183	61.6	11.3	21.6	87.9	48.0	52.7	62.3	70.0	75.3
2013	207	62.5	10.3	30.0	91.0	49.8	55.6	62.5	69.7	75.8
2014	170	62.0	10.6	28.7	93.5	48.2	55.0	61.6	69.9	74.7
2015	172	63.2	11.3	28.5	93.2	50.3	55.4	62.4	70.6	77.8
2016	135	63.4	12.4	21.1	89.1	49.2	54.8	63.7	72.8	78.5
2017	122	65.9	11.8	30.1	96.1	51.1	57.5	66.2	74.6	80.1
2018	77	64.5	11.0	37.6	92.6	51.2	57.8	65.0	71.9	77.3
2019	45	66.9	8.5	50.8	82.4	56.6	61.9	65.7	72.3	79.0
2020	41	65.7	13.1	32.3	91.4	50.2	58.0	67.3	75.1	82.1
1998–2020	3153	61.4	11.5	0.9	101	47.5	53.5	61.1	69.1	76.4

Table 3b

Age distribution parameters by year of diagnosis (FEMALES)
(incl. DCO)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	41	62.9	13.4	31.1	91.4	49.5	57.5	62.5	75.1	78.4
1999	52	63.5	13.8	25.6	95.7	48.3	55.6	65.2	71.1	77.6
2000	32	61.4	14.2	33.5	85.8	45.2	50.7	60.1	70.3	82.1
2001	40	66.4	12.0	44.0	92.5	51.3	57.0	63.9	71.9	85.9
2002	67	66.1	14.2	35.8	99.0	50.3	54.9	64.3	77.3	82.9
2003	61	63.6	15.1	32.6	98.2	45.7	51.7	61.5	76.1	81.2
2004	68	66.7	13.9	26.4	97.9	48.9	57.2	67.2	77.7	83.1
2005	62	64.3	13.0	33.0	98.7	50.7	57.1	62.0	68.5	83.7
2006	68	64.2	14.9	19.0	96.2	47.5	55.9	63.5	76.0	83.2
2007	78	65.1	13.7	34.0	98.2	47.5	55.3	63.6	73.6	83.6
2008	88	63.7	12.7	26.7	97.6	49.7	54.4	63.4	71.3	79.4
2009	97	64.6	14.2	29.6	98.4	47.4	55.5	64.9	75.1	82.8
2010	94	66.2	13.9	21.9	91.8	48.1	56.2	66.8	74.6	85.4
2011	83	65.8	14.0	31.2	96.9	48.6	56.5	67.3	75.1	84.0
2012	90	65.1	13.6	28.5	100	48.3	57.4	65.1	73.3	82.3
2013	96	67.5	13.9	28.1	95.5	47.4	59.0	67.5	76.1	86.9
2014	81	65.8	12.6	33.5	90.9	51.4	57.2	66.4	72.9	81.9
2015	81	65.8	12.9	28.9	90.3	50.3	56.8	67.2	74.6	82.9
2016	64	66.3	12.7	37.2	91.3	47.8	57.5	66.9	76.0	81.0
2017	59	66.3	15.4	14.0	96.5	48.2	57.2	67.9	74.9	87.4
2018	49	66.8	11.9	37.9	92.0	52.8	57.7	67.0	73.6	83.6
2019	27	66.6	12.7	51.0	99.0	51.9	57.0	62.8	74.3	90.8
2020	28	66.4	13.3	30.8	93.8	55.6	59.4	63.8	74.6	83.1
1998–2020	1506	65.3	13.6	14.0	100	48.6	56.1	65.4	74.8	83.2

Table 4

Age distribution by 5-year age group and sex for period 2007-2020 (incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4									
5-9									
10-14	1	0.0	0.0			0.0	1	0.1	0.1
15-19	0	0.0	0.0			0.0			0.1
20-24	6	0.2	0.2	5	0.2	0.2	1	0.1	0.2
25-29	14	0.5	0.7	9	0.4	0.7	5	0.5	0.7
30-34	26	0.8	1.5	11	0.5	1.2	15	1.5	2.2
35-39	33	1.1	2.6	24	1.2	2.4	9	0.9	3.1
40-44	83	2.7	5.3	58	2.8	5.2	25	2.5	5.5
45-49	210	6.8	12.1	150	7.3	12.4	60	5.9	11.4
50-54	380	12.3	24.4	284	13.8	26.2	96	9.5	20.9
55-59	478	15.5	40.0	345	16.7	42.9	133	13.1	34.0
60-64	472	15.3	55.3	338	16.4	59.3	134	13.2	47.2
65-69	463	15.0	70.3	315	15.3	74.5	148	14.6	61.8
70-74	396	12.9	83.2	248	12.0	86.5	148	14.6	76.4
75-79	248	8.1	91.2	159	7.7	94.2	89	8.8	85.1
80-84	136	4.4	95.6	68	3.3	97.5	68	6.7	91.8
85+	134	4.4	100.0	51	2.5	100.0	83	8.2	100.0
All ages	3080	100.0		2065	100.0		1015	100.0	

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 2007–2020

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=65 %	Females DCO rate n=27 %	Males Prop.all cancers n=153686 %	Females Prop.all cancers n=155051 %
0– 4								
5– 9								
10–14		1		0.1				0.8
15–19								
20–24	5	1	0.2	0.1			0.8	0.2
25–29	9	5	0.4	0.2			0.9	0.4
30–34	11	15	0.5	0.7			0.8	0.7
35–39	24	9	1.0	0.4			1.3	0.3
40–44	58	25	2.3	1.0			2.1	0.4
45–49	150	60	5.6	2.3			3.0	0.6
50–54	281	95	11.0	3.8	1.1		3.3	0.8
55–59	341	131	16.1	6.0	1.8	3.1	2.7	1.0
60–64	335	133	18.9	7.0	3.0	1.5	1.9	0.9
65–69	314	147	19.2	8.1	4.8	1.4	1.3	0.8
70–74	248	147	16.5	8.5	4.4	1.4	0.9	0.7
75–79	159	89	13.1	5.9	5.0	1.1	0.7	0.5
80–84	68	65	9.4	6.1	4.4	3.1	0.4	0.4
85+	51	83	10.9	8.0	17.6	16.9	0.5	0.5
All ages	2054	1006			3.2	2.7	1.3	0.6
Incidence								
Raw			6.3	3.0				
WS			3.7	1.5				
ES			5.1	2.1				
BRD-S			5.8	2.5				

The age-specific incidence characterizes the disease risk in a particular age group. The age distribution depends on the patient population frequency in each age group and reflects the tangible clinical picture of everyday patients care (see following chart).

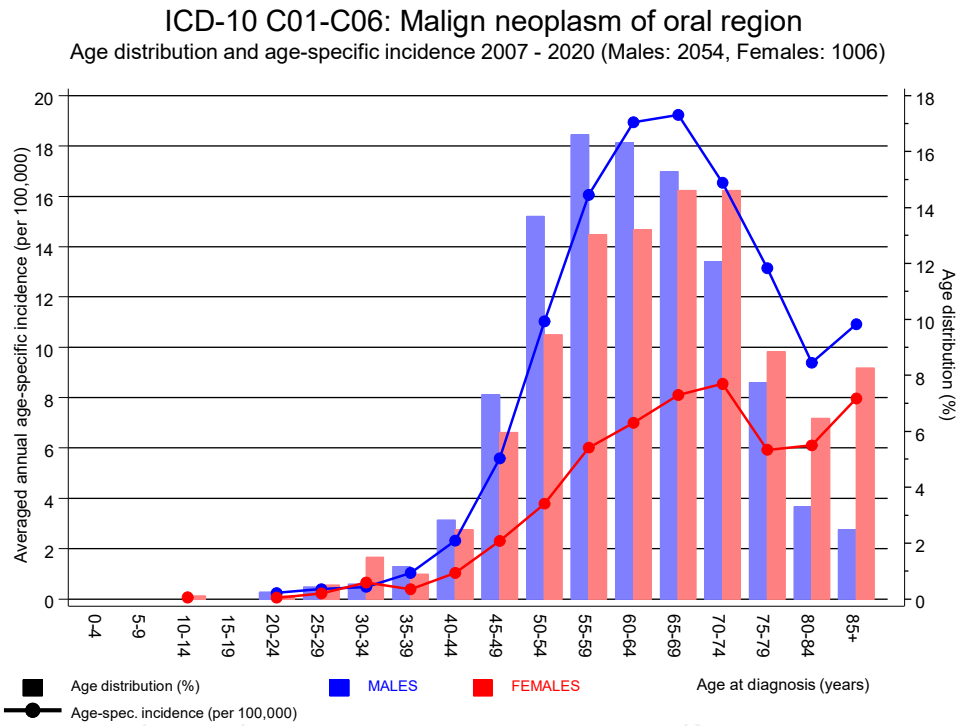

Figure 6. Age distribution (males: mean=62.4 yrs, median=62.2 yrs; females: mean=65.7 yrs, median=66.0 yrs) and age-specific incidence.

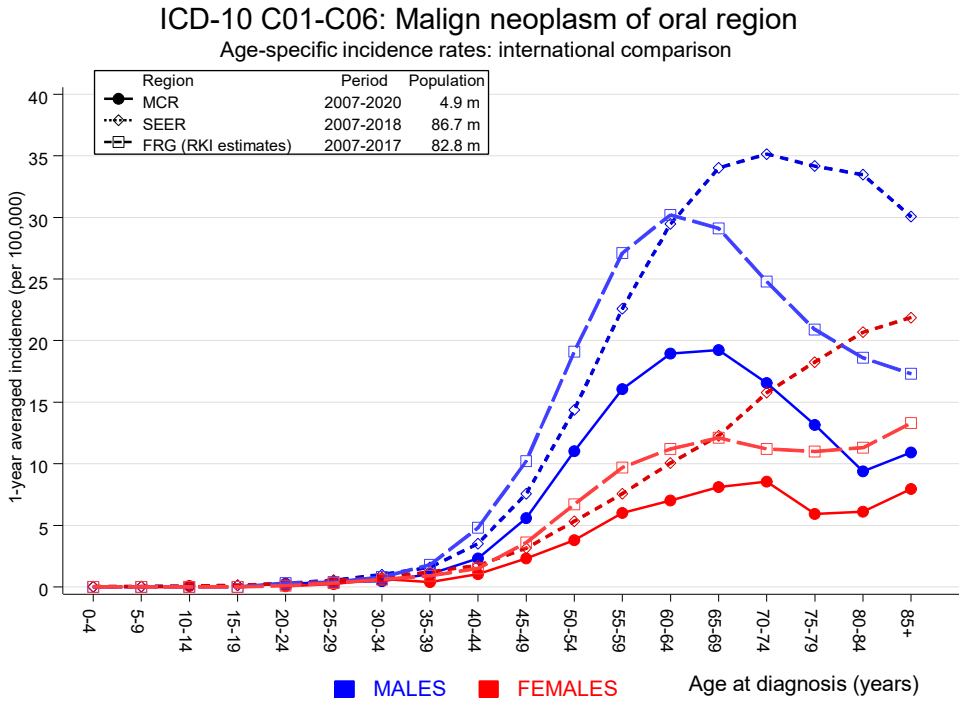

Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, RKI estimates) and SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Estimated age-specific patient population of Germany, latest update: 16 March 2021. German Centre for Cancer Registry Data, Robert Koch Institute (RKI), based on data of the population based cancer registries. http://www.krebsdaten.de. Last access: 08/17/2021
Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 21 Regs Research Data, released April 2021, based on the November 2020 submission. http://www.seer.cancer.gov.

Table 7a

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998–2020

MALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
		2	0.0	61.6	7.5	222.5	#	1.7	
C00	Lip	2	0.1	15.6	1.9	56.2	#	1.7	
C03–C06	Oral cavity	36	1.5	23.3	16.3	32.3	#	30.6	
C09–C10	Oropharynx	63	2.0	31.7	24.4	40.6	#	54.2	1.6
C11	Nasopharynx	2	0.1	15.3	1.9	55.2	#	1.7	
C12–C13	Hypopharynx	55	1.0	52.5	39.6	68.4	#	48.0	7.3
C15	Oesophagus	80	3.1	25.7	20.4	32.0	#	68.4	7.5
C16	Stomach	13	4.8	2.7	1.4	4.6	#	7.3	15.4
C17	Small intestine	3	0.9	3.5	0.7	10.2		1.9	33.3
C18	Colon	29	11.8	2.5	1.6	3.5	#	15.3	3.4
C19–C20	Rectum	17	7.5	2.3	1.3	3.6	#	8.5	
C21	Anus/canal	2	0.4	5.3	0.6	19.2		1.4	
C22	Liver	15	4.0	3.8	2.1	6.2	#	9.8	13.3
C23–C24	Bile	3	1.3	2.3	0.5	6.7		1.5	66.7
C25	Pancreas	13	5.0	2.6	1.4	4.4	#	7.1	7.7
C30–C31	Sinuses	4	0.3	14.8	4.0	37.9	#	3.3	25.0
C32	Larynx	42	1.6	26.5	19.1	35.8	#	35.9	16.7
C33–C34	Lung	174	16.3	10.7	9.2	12.4	#	140.3	12.1
C38,C45	Mesothelioma	2	0.8	2.4	0.3	8.6		1.0	
C43	Malign. melanoma	15	6.5	2.3	1.3	3.8	#	7.5	6.7
C46,C49	Soft tissue	6	0.8	7.7	2.8	16.8	#	4.6	
C61	Prostate	52	37.6	1.4	1.0	1.8	#	12.8	3.8
C64	Kidney	20	4.9	4.1	2.5	6.3	#	13.4	
C65	Renal pelvis	2	0.5	3.8	0.5	13.6		1.3	
C67	Bladder	20	5.4	3.7	2.2	5.7	#	12.9	5.0
C68	Urethra	4	0.1	32.1	8.8	82.3	#	3.4	
C70–C72	CNS cancer	3	1.9	1.6	0.3	4.7		1.0	
C73	Thyroid	6	1.2	5.1	1.9	11.0	#	4.3	
C76–C79	CUP	13	2.2	6.0	3.2	10.2	#	9.6	
C81	Hodgkin lymphoma	2	0.4	5.5	0.7	20.0		1.5	50.0
C82–C85	NHL	17	5.5	3.1	1.8	5.0	#	10.3	17.6
C91–C96	Leukaemia	6	1.8	3.3	1.2	7.2	#	3.7	16.7
	Others, specified	6	1.8	3.4	1.2	7.4	#	3.8	16.7
	Not observed	0	2.9	0.0	0.0	1.3		-2.6	
	All further malignancies	729	136.1	5.4	5.0	5.8	#	527.2	8.1

Patients	3011
Median age at next malignancy (years)	64.9
Person-years	11247
Mean observation time (years)	3.7
Median observation time (years)	2.1

The occurrence of further specified malignancy is statistically significant.

Further observed malignancies with count 1 are pooled in category “Others, specified”.

Table 7b

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998–2020
FEMALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C00	Lip	2	0.0	51.5	6.2	186.0	#	3.3	
C03–C06	Oral cavity	24	0.4	63.5	40.7	94.4	#	40.1	
C09–C10	Oropharynx	27	0.3	93.6	61.7	136.2	#	45.3	
C11	Nasopharynx	3	0.0	137.5	28.4	401.8	#	5.1	
C12–C13	Hypopharynx	13	0.1	177.8	94.7	304.1	#	21.9	30.8
C14	ENT cancer	3	0.0	340.0	70.1	993.7	#	5.1	100.0
C15	Oesophagus	16	0.4	38.0	21.7	61.7	#	26.4	12.5
C16	Stomach	7	2.0	3.6	1.4	7.4	#	8.6	14.3
C18	Colon	12	5.6	2.1	1.1	3.7	#	10.8	
C19–C20	Rectum	8	2.4	3.4	1.5	6.7	#	9.6	
C22	Liver	7	0.7	9.4	3.8	19.4	#	10.6	
C23–C24	Bile	3	0.8	3.7	0.8	10.9		3.7	
C25	Pancreas	8	2.7	2.9	1.3	5.8	#	9.0	12.5
C30–C31	Sinuses	5	0.1	59.2	19.2	138.2	#	8.3	40.0
C32	Larynx	11	0.1	91.4	45.6	163.5	#	18.5	18.2
C33–C34	Lung	63	4.8	13.0	10.0	16.6	#	98.6	15.9
C40–C41	Bone	3	0.1	50.4	10.4	147.2	#	5.0	66.7
C43	Malign. melanoma	3	2.4	1.2	0.3	3.6		1.0	
C50	Breast	31	19.5	1.6	1.1	2.3	#	19.5	3.2
C51	Vulva	3	0.6	4.8	1.0	14.0		4.0	
C53	Cervix uteri	6	0.8	7.2	2.6	15.6	#	8.8	16.7
C54	Corpus uteri	4	3.5	1.2	0.3	2.9		0.9	
C56	Ovary	3	2.5	1.2	0.3	3.6		0.9	
C67	Bladder	5	1.1	4.4	1.4	10.2	#	6.5	40.0
C70–C72	CNS cancer	2	0.8	2.5	0.3	9.0		2.0	50.0
C73	Thyroid	4	1.1	3.7	1.0	9.4	#	4.9	
C76–C79	CUP	6	1.1	5.7	2.1	12.4	#	8.4	
C82–C85	NHL	12	2.3	5.1	2.7	9.0	#	16.4	
Others, specified		9	4.1	2.2	1.0	4.2	#	8.3	
Not observed		0	1.5	0.0	0.0	2.4		-2.6	
All further malignancies		303	61.9	4.9	4.4	5.5	#	408.9	10.6

Patients	1427
Median age at next malignancy (years)	68.5
Person-years	5896
Mean observation time (years)	4.1
Median observation time (years)	2.5

The occurrence of further specified malignancy is statistically significant.

Further observed malignancies with count 1 are pooled in category “Others, specified”.

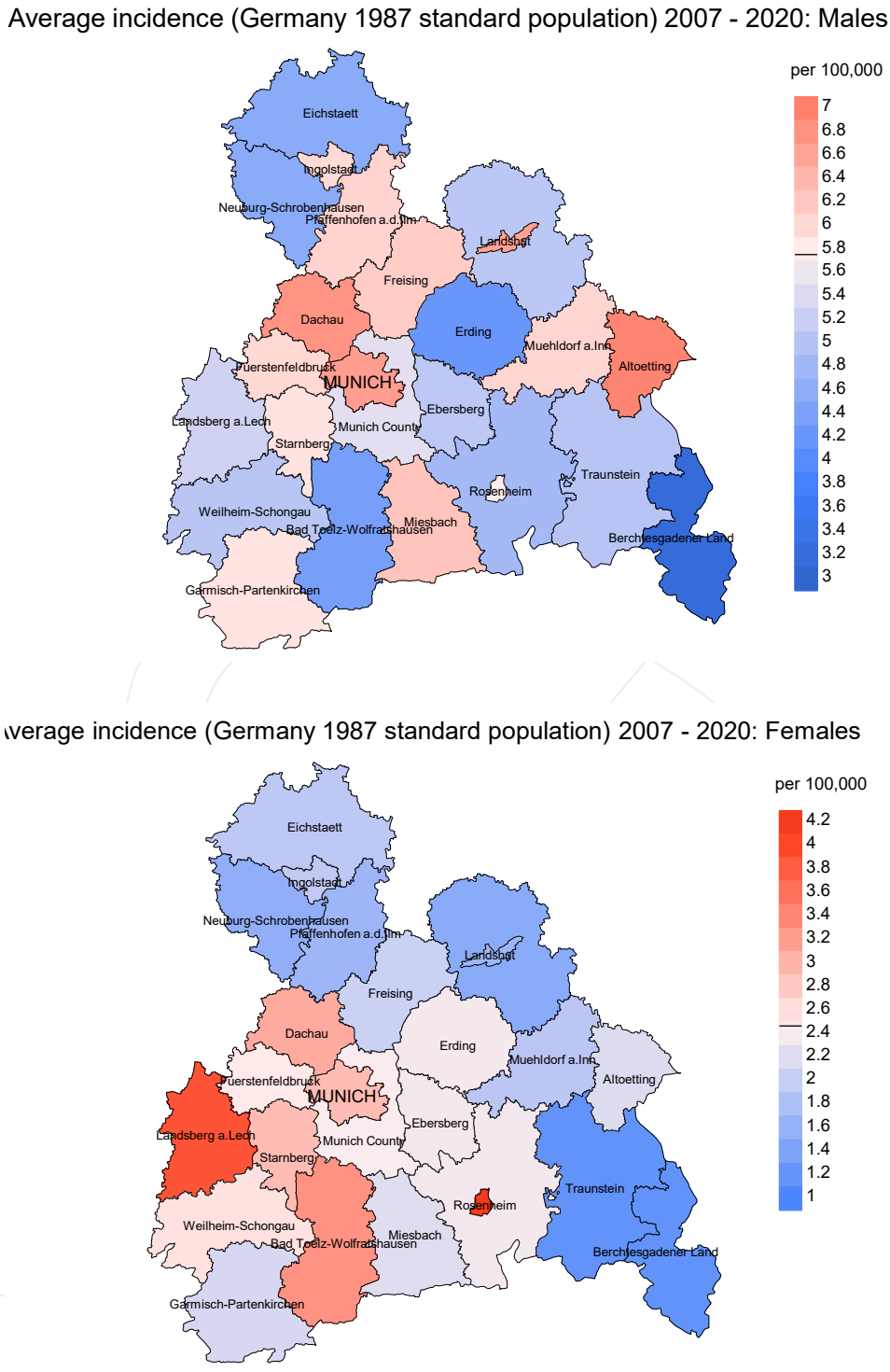

Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 5.8/100,000 WS N=2,054, females 2.5/100,000 WS N=1,006).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 28 women were identified with newly diagnosed oral region cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 2.4/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.4 and 3.8/100,000.

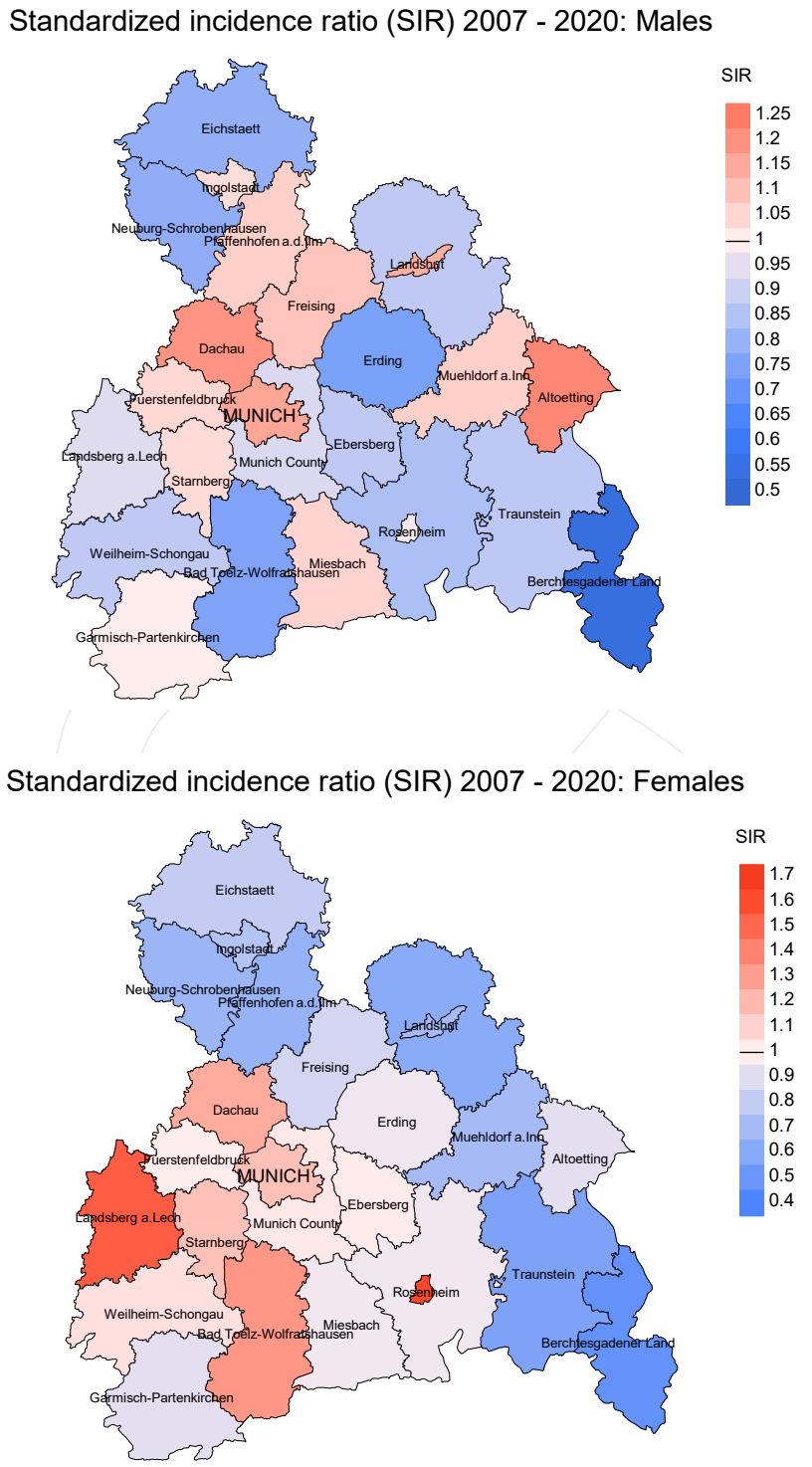

Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=2,054, females N=1,006).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2020 a total of 28 women were identified with newly diagnosed oral region cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.01. Though, the value of this parameter may vary with an underlying probability of 99% between 0.58 and 1.61, and is therefore not statistically striking.

MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status, proportion of DCO, deaths among the annual cohorts and proportion of available death certificates (with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Prop. DCO %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	127	99.2	5.5	107	84.3	92.5
1999	135	96.3	4.4	113	83.7	88.5
2000	120	98.3	5.0	97	80.8	96.9
2001	132	98.5	6.1	114	86.4	93.0
2002	209	98.1	5.7	171	81.8	94.7
2003	221	99.5	6.3	180	81.4	96.1
2004	227	97.4	4.4	177	78.0	94.9
2005	190	96.3	4.7	146	76.8	95.2
2006	218	96.3	2.3	171	78.4	93.6
2007	262	93.5	4.2	191	72.9	97.4
2008	267	98.1	3.0	197	73.8	95.9
2009	278	98.6	1.8	190	68.3	92.6
2010	300	98.7	5.0	207	69.0	95.2
2011	246	98.0	2.8	147	59.8	93.9
2012	273	98.2	3.3	155	56.8	89.7
2013	303	98.3	2.3	181	59.7	92.3
2014	251	97.2	3.6	141	56.2	92.9
2015	253	97.2	2.8	138	54.5	91.3
2016	199	99.5	2.0	99	49.7	94.9
2017	181	100.0	1.7	75	41.4	69.3
2018	126	100.0	4.0	47	37.3	74.5
2019	72	100.0	1.4	31	43.1	93.5
2020	69	98.6	1.4	21	30.4	100.0
1998-2020	4659	97.9	3.6	3096	66.5	93.1

Table 9b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased within the same year of being diagnosed with cancer (incl. DCO)
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Prop. deaths with death certific. %	Deaths in same year n	Prop. deaths in same year %
1998	127	74	93.2	16	12.6
1999	135	69	89.9	12	8.9
2000	120	84	92.9	15	12.5
2001	132	113	92.0	25	18.9
2002	209	149	98.0	32	15.3
2003	221	159	97.5	35	15.8
2004	227	160	96.9	42	18.5
2005	190	143	98.6	24	12.6
2006	218	175	95.4	32	14.7
2007	262	159	97.5	33	12.6
2008	267	160	98.1	34	12.7
2009	278	212	97.6	30	10.8
2010	300	198	99.5	41	13.7
2011	246	201	97.0	27	11.0
2012	273	202	97.5	31	11.4
2013	303	194	99.0	47	15.5
2014	251	191	97.9	39	15.5
2015	253	191	98.4	30	11.9
2016	199	194	99.0	33	16.6
2017	181	203	95.1	20	11.0
2018	126	144	64.6	15	11.9
2019	72	128	40.6	11	15.3
2020	69	154	91.6	6	8.7
1998–2020	4659	3657	93.6	630	13.5

Table 9c

Annual cohorts of deaths, proportion of cancer-related and non-cancer-related deaths, and cancer recorded on death certificates (incl. DCO)
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	74	74.3	25.7	91.3
1999	69	63.8	36.2	83.9
2000	84	64.3	35.7	82.1
2001	113	80.5	19.5	93.3
2002	149	78.5	21.5	91.8
2003	159	73.6	26.4	86.5
2004	160	78.8	21.3	91.0
2005	143	89.5	10.5	95.7
2006	175	74.9	25.1	86.2
2007	159	78.0	22.0	89.7
2008	160	80.0	20.0	91.7
2009	212	79.7	20.3	87.4
2010	198	79.8	20.2	90.9
2011	201	76.6	23.4	85.6
2012	202	77.2	22.8	88.8
2013	194	77.3	22.7	88.5
2014	191	74.9	25.1	84.5
2015	191	68.6	31.4	83.0
2016	194	75.8	24.2	82.8
2017	203	72.9	27.1	82.9
2018	144	54.9	45.1	74.2
2019	128	36.7	63.3	84.6
2020	154	44.2	55.8	75.9
1998-2020	3657	72.9	27.1	86.8

Table 10a

Medians of age at death according to the grouping in Table 9
MALES

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	53	60.6	59.8	63.3	60.7
1999	51	57.4	57.5	57.2	56.0
2000	66	63.2	62.0	65.5	63.2
2001	85	61.4	60.5	66.8	61.2
2002	108	62.0	61.6	63.7	61.6
2003	116	63.3	63.5	62.5	63.9
2004	117	63.8	62.4	68.0	63.5
2005	90	65.4	65.1	74.5	65.3
2006	122	64.0	63.7	66.7	63.9
2007	119	63.5	62.2	66.9	63.0
2008	113	63.2	62.6	66.2	62.6
2009	150	65.9	65.1	69.3	65.2
2010	140	66.1	64.7	69.6	65.3
2011	149	67.1	65.0	71.6	64.6
2012	146	67.5	66.1	70.7	65.8
2013	127	66.6	65.4	73.8	65.9
2014	132	68.9	67.6	72.6	67.8
2015	133	67.0	66.6	69.8	66.7
2016	126	67.7	66.3	73.8	66.3
2017	146	69.0	68.4	69.7	68.3
2018	99	68.9	68.6	69.7	68.8
2019	87	72.1	70.4	73.0	69.5
2020	106	70.1	69.0	72.2	68.2
1998-2020	2581	65.7	64.8	69.5	65.0

Deaths of patients are considered to be cancer-related, in case that fact was recorded on the death certificate, or patients had suffered from metastasis or recurrence.

Table 10b

Medians of age at death according to the grouping in Table 9
FEMALES

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	21	61.6	61.6	64.7	61.6
1999	18	71.3	59.7	82.3	61.0
2000	18	70.4	67.6	85.4	70.4
2001	28	71.4	69.6	74.4	71.0
2002	41	73.6	71.9	82.9	73.4
2003	43	69.6	63.2	72.7	65.7
2004	43	73.7	73.7	73.2	73.0
2005	53	67.5	65.5	89.3	66.8
2006	53	69.8	66.6	79.5	66.6
2007	40	74.5	74.8	74.2	71.4
2008	47	72.2	69.6	72.5	69.5
2009	62	70.4	68.9	83.9	69.9
2010	58	73.0	69.0	84.1	70.0
2011	52	73.4	71.9	74.7	71.3
2012	56	72.1	69.5	82.7	69.5
2013	67	76.3	73.5	86.4	74.0
2014	59	74.3	70.5	79.0	73.0
2015	58	72.3	71.7	73.3	71.7
2016	68	75.8	74.9	85.1	75.2
2017	57	75.0	72.2	82.9	73.0
2018	45	72.7	68.0	76.0	68.7
2019	41	79.4	78.8	80.8	79.0
2020	48	73.3	71.2	76.5	72.9
1998–2020	1076	73.1	70.6	79.3	71.4

By 2018, Bavarians' life expectancy at birth is estimated at 79.3 years for boys and 83.8 years for girls.

Deaths of patients are considered to be cancer-related, in case that fact was recorded on the death certificate, or patients had suffered from metastasis or recurrence.

Table 11a

Mortality measures (cancer-related death) and mortality-incidence-index
by year of death
MALES

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	40	3.6	0.47	2.4	0.45	3.2	0.45	3.8	0.47
1999	34	3.0	0.41	1.9	0.41	2.7	0.42	3.0	0.44
2000	43	3.8	0.49	2.3	0.45	3.4	0.48	4.3	0.56
2001	69	6.0	0.76	3.8	0.76	5.3	0.76	6.1	0.76
2002	84	4.5	0.59	2.8	0.56	4.0	0.59	4.6	0.63
2003	89	4.7	0.56	2.9	0.52	4.0	0.53	4.6	0.56
2004	93	4.9	0.58	3.1	0.57	4.3	0.58	4.9	0.59
2005	80	4.2	0.63	2.4	0.57	3.5	0.60	4.2	0.64
2006	93	4.9	0.62	3.0	0.61	4.1	0.60	4.7	0.60
2007	95	4.3	0.52	2.6	0.50	3.7	0.51	4.1	0.52
2008	97	4.4	0.54	2.6	0.51	3.6	0.52	4.2	0.55
2009	122	5.5	0.69	3.1	0.65	4.4	0.66	5.1	0.68
2010	110	4.9	0.54	2.8	0.50	4.0	0.52	4.6	0.54
2011	113	5.1	0.70	2.8	0.66	4.1	0.68	4.8	0.72
2012	115	5.1	0.63	2.7	0.57	3.9	0.60	4.6	0.62
2013	99	4.3	0.48	2.4	0.46	3.4	0.46	4.0	0.48
2014	104	4.5	0.62	2.4	0.54	3.4	0.57	4.0	0.60
2015	92	3.9	0.53	2.1	0.50	2.9	0.51	3.5	0.54
2016	94	3.9	0.70	2.2	0.67	3.0	0.68	3.6	0.70
2017	108	4.5	0.89	2.3	0.85	3.3	0.87	4.0	0.88
2018	56	2.3	0.73	1.2	0.65	1.7	0.67	2.1	0.72
2019	33	1.4	0.73	0.6	0.63	0.9	0.66	1.2	0.73
2020	47	1.9	1.15	1.0	1.12	1.4	1.15	1.7	1.15
1998-2020	1910	4.1	0.61	2.3	0.57	3.3	0.59	3.8	0.61

Table 11b

Mortality measures (cancer-related death) and mortality-incidence-index
by year of death
FEMALES

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	15	1.3	0.38	0.7	0.37	1.0	0.38	1.2	0.37
1999	10	0.8	0.19	0.5	0.18	0.6	0.18	0.7	0.19
2000	11	0.9	0.34	0.5	0.30	0.7	0.31	0.8	0.32
2001	22	1.8	0.55	0.9	0.51	1.2	0.50	1.6	0.56
2002	33	1.7	0.49	0.8	0.43	1.1	0.44	1.4	0.47
2003	28	1.4	0.46	0.8	0.44	1.1	0.45	1.3	0.46
2004	33	1.7	0.49	0.7	0.42	1.1	0.45	1.4	0.47
2005	48	2.4	0.77	1.2	0.68	1.7	0.72	2.0	0.76
2006	38	1.9	0.56	0.9	0.45	1.2	0.48	1.5	0.49
2007	29	1.3	0.37	0.5	0.28	0.8	0.30	1.0	0.33
2008	31	1.3	0.36	0.6	0.30	0.9	0.31	1.1	0.33
2009	47	2.0	0.49	0.9	0.43	1.4	0.44	1.6	0.45
2010	48	2.1	0.52	1.0	0.48	1.4	0.50	1.6	0.51
2011	41	1.8	0.49	0.7	0.41	1.1	0.42	1.2	0.42
2012	41	1.7	0.46	0.8	0.40	1.1	0.41	1.3	0.42
2013	51	2.1	0.54	0.9	0.44	1.3	0.46	1.6	0.51
2014	40	1.7	0.49	0.7	0.42	1.0	0.43	1.2	0.45
2015	39	1.6	0.49	0.7	0.39	1.0	0.41	1.2	0.45
2016	53	2.2	0.83	0.8	0.60	1.2	0.66	1.6	0.73
2017	40	1.6	0.68	0.7	0.52	1.0	0.56	1.2	0.61
2018	23	0.9	0.47	0.5	0.45	0.6	0.46	0.7	0.45
2019	15	0.6	0.56	0.2	0.31	0.3	0.36	0.4	0.46
2020	21	0.8	0.84	0.4	0.71	0.5	0.75	0.7	0.78
1998-2020	757	1.6	0.51	0.7	0.43	1.0	0.45	1.2	0.47

Table 12

Age distribution of age at death (cancer-related) for period 2007-2020
(**incl. multiple malignancies**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4									
5-9									
10-14									
15-19									
20-24									
25-29	2	0.1	0.1	1	0.1	0.1	1	0.2	0.2
30-34	3	0.2	0.3	2	0.2	0.2	1	0.2	0.4
35-39	9	0.5	0.8	5	0.4	0.6	4	0.8	1.2
40-44	27	1.5	2.3	21	1.6	2.3	6	1.2	2.3
45-49	60	3.3	5.6	49	3.8	6.1	11	2.1	4.4
50-54	151	8.4	14.0	128	10.0	16.0	23	4.4	8.9
55-59	226	12.5	26.5	182	14.2	30.2	44	8.5	17.3
60-64	270	15.0	41.5	207	16.1	46.3	63	12.1	29.5
65-69	314	17.4	58.9	235	18.3	64.6	79	15.2	44.7
70-74	280	15.5	74.4	193	15.0	79.6	87	16.8	61.5
75-79	207	11.5	85.9	149	11.6	91.2	58	11.2	72.6
80-84	107	5.9	91.8	63	4.9	96.1	44	8.5	81.1
85+	148	8.2	100.0	50	3.9	100.0	98	18.9	100.0
All ages	1804	100.0		1285	100.0		519	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**incl. multiple malignancies**)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29	1	1	0.0	0.11	0.0	0.20	1.1	1.0
30-34	2	1	0.1	0.18	0.0	0.07	1.4	0.6
35-39	5	4	0.2	0.21	0.2	0.44	1.9	1.0
40-44	21	6	0.8	0.36	0.2	0.24	3.5	0.7
45-49	49	11	1.8	0.33	0.4	0.18	3.5	0.7
50-54	128	23	5.0	0.46	0.9	0.24	4.8	0.9
55-59	182	44	8.6	0.53	2.0	0.34	4.1	1.2
60-64	207	63	11.7	0.62	3.3	0.47	3.2	1.3
65-69	235	79	14.4	0.75	4.4	0.54	2.6	1.1
70-74	193	87	12.9	0.78	5.1	0.59	1.6	1.0
75-79	149	58	12.3	0.94	3.9	0.65	1.2	0.6
80-84	63	44	8.7	0.93	4.1	0.68	0.6	0.5
85+	50	98	10.7	0.98	9.4	1.18	0.5	0.8
All ages	1285	519					1.9	0.8
Mortality								
Raw			3.9	0.63	1.5	0.52		
WS			2.2	0.58	0.7	0.42		
ES			3.1	0.60	1.0	0.44		
BRD-S			3.6	0.62	1.2	0.47		
PYLL-70								
per 100,000			30.1		7.9			
ES			25.5		6.6			
AYLL-70			10.4		9.7			

Table 14a

Further malignancies in deaths in period 1998–2020
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C00	Lip	5	0.4	3	60.0	1	20.0	1	20.0
C03–C06	Oral cavity	47	4.0	19	40.4	5	10.6	23	48.9
C07–C08	Salivary gland	3	0.3	2	66.7			1	33.3
C09–C10	Oropharynx	106	9.1	53	50.0	16	15.1	37	34.9
C11	Nasopharynx	2	0.2	1	50.0			1	50.0
C12–C13	Hypopharynx	87	7.5	32	36.8	14	16.1	41	47.1
C15	Oesophagus	109	9.4	19	17.4	18	16.5	72	66.1
C16	Stomach	22	1.9	4	18.2			18	81.8
C17	Small intestine	5	0.4	3	60.0			2	40.0
C18	Colon	37	3.2	13	35.1	3	8.1	21	56.8
C19–C20	Rectum	34	2.9	9	26.5	1	2.9	24	70.6
C21	Anus/canal	3	0.3	2	66.7			1	33.3
C22	Liver	28	2.4	5	17.9	3	10.7	20	71.4
C23–C24	Bile	4	0.3	1	25.0			3	75.0
C25	Pancreas	17	1.5	3	17.6			14	82.4
C30–C31	Sinuses	10	0.9	5	50.0			5	50.0
C32	Larynx	73	6.3	38	52.1	13	17.8	22	30.1
C33–C34	Lung	243	20.9	30	12.3	28	11.5	185	76.1
C38,C45	Mesothelioma	3	0.3	1	33.3			2	66.7
C43	Malign. melanoma	19	1.6	10	52.6	2	10.5	7	36.8
C44	Skin others	88	7.6	40	45.5	7	8.0	41	46.6
C46,C49	Soft tissue	7	0.6	4	57.1			3	42.9
C50	Breast	2	0.2	2	100.0				
C61	Prostate	59	5.1	31	52.5	3	5.1	25	42.4
C62	Testis	8	0.7	8	100.0				
C63	Male urogen.	2	0.2	2	100.0				
C64	Kidney	22	1.9	8	36.4	2	9.1	12	54.5
C65	Renal pelvis	4	0.3	1	25.0			3	75.0
C67	Bladder	32	2.7	16	50.0	1	3.1	15	46.9
C70–C72	CNS cancer	5	0.4					5	100.0
C73	Thyroid	8	0.7	4	50.0	1	12.5	3	37.5
C76–C79	CUP	33	2.8	18	54.5	3	9.1	12	36.4
C81	Hodgkin lymphoma	4	0.3	2	50.0			2	50.0
C82–C85	NHL	22	1.9	10	45.5	4	18.2	8	36.4
C91–C96	Leukaemia	8	0.7	2	25.0	1	12.5	5	62.5
Others, specified		3	0.3	1	33.3			2	66.7
All further malignancies		1164	100.0	402	34.5	126	10.8	636	54.6

Further malignancies with number of cases 1 are pooled in category “Others, specified”.

ICD-10 C44 (Other malignant neoplasms of skin) is not systematically recorded by MCR and therefore not considered for evaluation as a particular primary but at least as a further malignancy.

Table 14b

Further malignancies in deaths in period 1998–2020
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C00	Lip	2	0.5					2	100.0
C03–C06	Oral cavity	22	5.6	3	13.6	3	13.6	16	72.7
C07–C08	Salivary gland	1	0.3	1	100.0				
C09–C10	Oropharynx	34	8.7	9	26.5	5	14.7	20	58.8
C11	Nasopharynx	1	0.3					1	100.0
C12–C13	Hypopharynx	12	3.1	1	8.3	4	33.3	7	58.3
C14	ENT cancer	4	1.0			1	25.0	3	75.0
C15	Oesophagus	29	7.4	4	13.8	2	6.9	23	79.3
C16	Stomach	8	2.0	1	12.5	2	25.0	5	62.5
C18	Colon	16	4.1	7	43.8			9	56.3
C19–C20	Rectum	6	1.5	1	16.7			5	83.3
C21	Anus/canal	3	0.8					3	100.0
C22	Liver	7	1.8	1	14.3	1	14.3	5	71.4
C23–C24	Bile	3	0.8					3	100.0
C25	Pancreas	8	2.0	1	12.5			7	87.5
C30–C31	Sinuses	6	1.5	2	33.3			4	66.7
C32	Larynx	12	3.1	5	41.7	2	16.7	5	41.7
C33–C34	Lung	68	17.4	3	4.4	6	8.8	59	86.8
C40–C41	Bone	3	0.8					3	100.0
C43	Malign. melanoma	7	1.8	3	42.9	1	14.3	3	42.9
C44	Skin others	22	5.6	6	27.3	2	9.1	14	63.6
C46,C49	Soft tissue	1	0.3					1	100.0
C50	Breast	51	13.0	32	62.7	4	7.8	15	29.4
C51	Vulva	2	0.5	1	50.0			1	50.0
C52	Vagina	1	0.3	1	100.0				
C53	Cervix uteri	14	3.6	10	71.4			4	28.6
C54	Corpus uteri	5	1.3	4	80.0			1	20.0
C55,C57	Fem. genitals un	1	0.3	1	100.0				
C56	Ovary	7	1.8	4	57.1			3	42.9
C64	Kidney	2	0.5	1	50.0			1	50.0
C67	Bladder	5	1.3	2	40.0			3	60.0
C70–C72	CNS cancer	2	0.5					2	100.0
C73	Thyroid	1	0.3	1	100.0				
C76–C79	CUP	13	3.3	5	38.5	1	7.7	7	53.8
C81	Hodgkin lymphoma	1	0.3					1	100.0
C82–C85	NHL	9	2.3	1	11.1	2	22.2	6	66.7
C90	Mult. myeloma	1	0.3					1	100.0
C91–C96	Leukaemia	1	0.3	1	100.0				
All further malignancies		391	100.0	112	28.6	36	9.2	243	62.1

ICD-10 C44 (Other malignant neoplasms of skin) is not systematically recorded by MCR and therefore not considered for evaluation as a particular primary but at least as a further malignancy.

Table 15

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**First primaries only** *)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29	1	1	0.0	0.13	0.0	0.20	1.2	1.1
30-34	2	1	0.1	0.18	0.0	0.08	1.4	0.6
35-39	4	2	0.2	0.19	0.1	0.33	1.6	0.5
40-44	18	6	0.7	0.34	0.2	0.25	3.2	0.8
45-49	40	9	1.5	0.30	0.3	0.17	3.1	0.6
50-54	101	17	4.0	0.44	0.7	0.21	4.3	0.8
55-59	140	38	6.6	0.54	1.7	0.37	3.6	1.2
60-64	153	47	8.7	0.63	2.5	0.45	2.9	1.2
65-69	176	59	10.8	0.80	3.3	0.54	2.4	1.1
70-74	132	71	8.8	0.80	4.1	0.63	1.5	1.0
75-79	105	48	8.7	1.07	3.2	0.72	1.2	0.6
80-84	40	36	5.5	1.11	3.4	0.77	0.5	0.5
85+	38	80	8.1	1.09	7.7	1.18	0.6	0.8
All ages	950	415					1.8	0.8
Mortality								
Raw			2.9	0.63	1.2	0.52		
WS			1.6	0.58	0.5	0.42		
ES			2.3	0.60	0.8	0.45		
BRD-S			2.7	0.63	0.9	0.48		
PYLL-70								
per 100,000			23.5		6.3			
ES			20.0		5.2			
AYLL-70			10.6		9.9			

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**Single primaries only** *)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29	1	1	0.0	0.14	0.0	0.20	1.2	1.1
30-34	1	1	0.0	0.10	0.0	0.09	0.7	0.6
35-39	4		0.2	0.19			1.6	
40-44	16	6	0.6	0.36	0.2	0.27	2.9	0.8
45-49	34	9	1.3	0.31	0.3	0.20	2.7	0.6
50-54	82	15	3.2	0.42	0.6	0.22	3.5	0.7
55-59	96	29	4.5	0.43	1.3	0.35	2.5	0.9
60-64	100	34	5.7	0.49	1.8	0.36	1.9	0.9
65-69	108	41	6.6	0.62	2.3	0.46	1.5	0.8
70-74	89	47	5.9	0.67	2.7	0.49	1.0	0.7
75-79	62	29	5.1	0.71	1.9	0.55	0.7	0.4
80-84	26	26	3.6	0.79	2.4	0.63	0.4	0.4
85+	34	65	7.3	1.10	6.2	1.07	0.6	0.7
All ages	653	303					1.3	0.6
Mortality								
Raw			2.0	0.51	0.9	0.45		
WS			1.1	0.48	0.4	0.36		
ES			1.6	0.49	0.6	0.38		
BRD-S			1.8	0.51	0.7	0.40		
PYLL-70								
per 100,000			17.7		5.1			
ES			15.0		4.2			
AYLL-70			11.5		10.5			

* See corresponding tables with multiple malignancies.

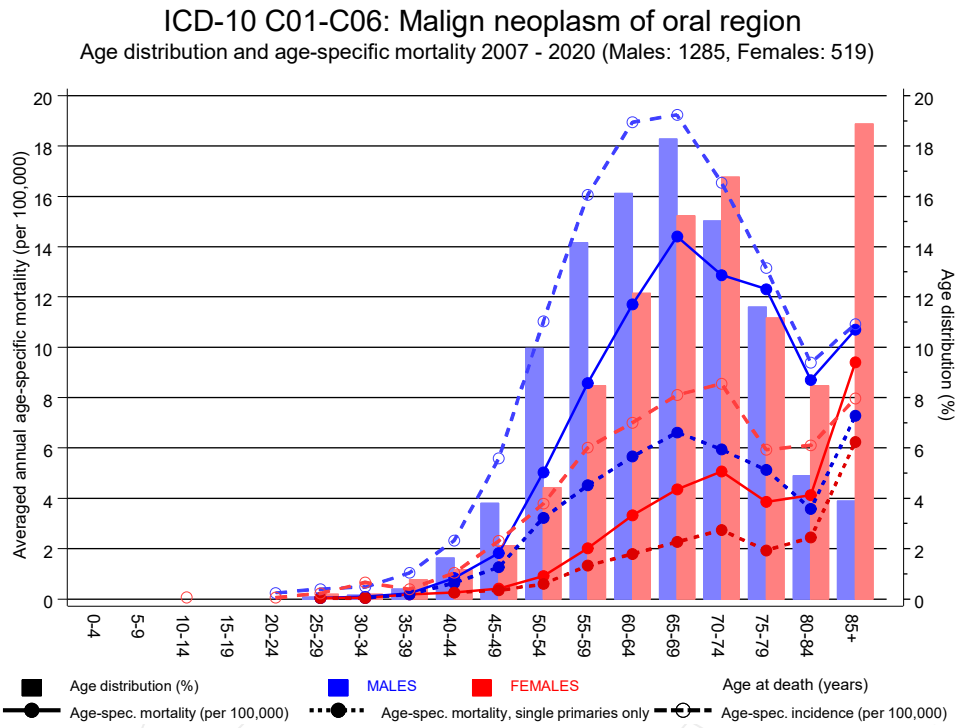

Figure 17. Distribution of age at death (bars; males: mean=61.3 yrs, median=60.8 yrs; females: mean=67.3 yrs, median=67.6 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

The difference between age at diagnosis (Table 3) and age at oral region cancer-related death (see Table 10) should be considered.

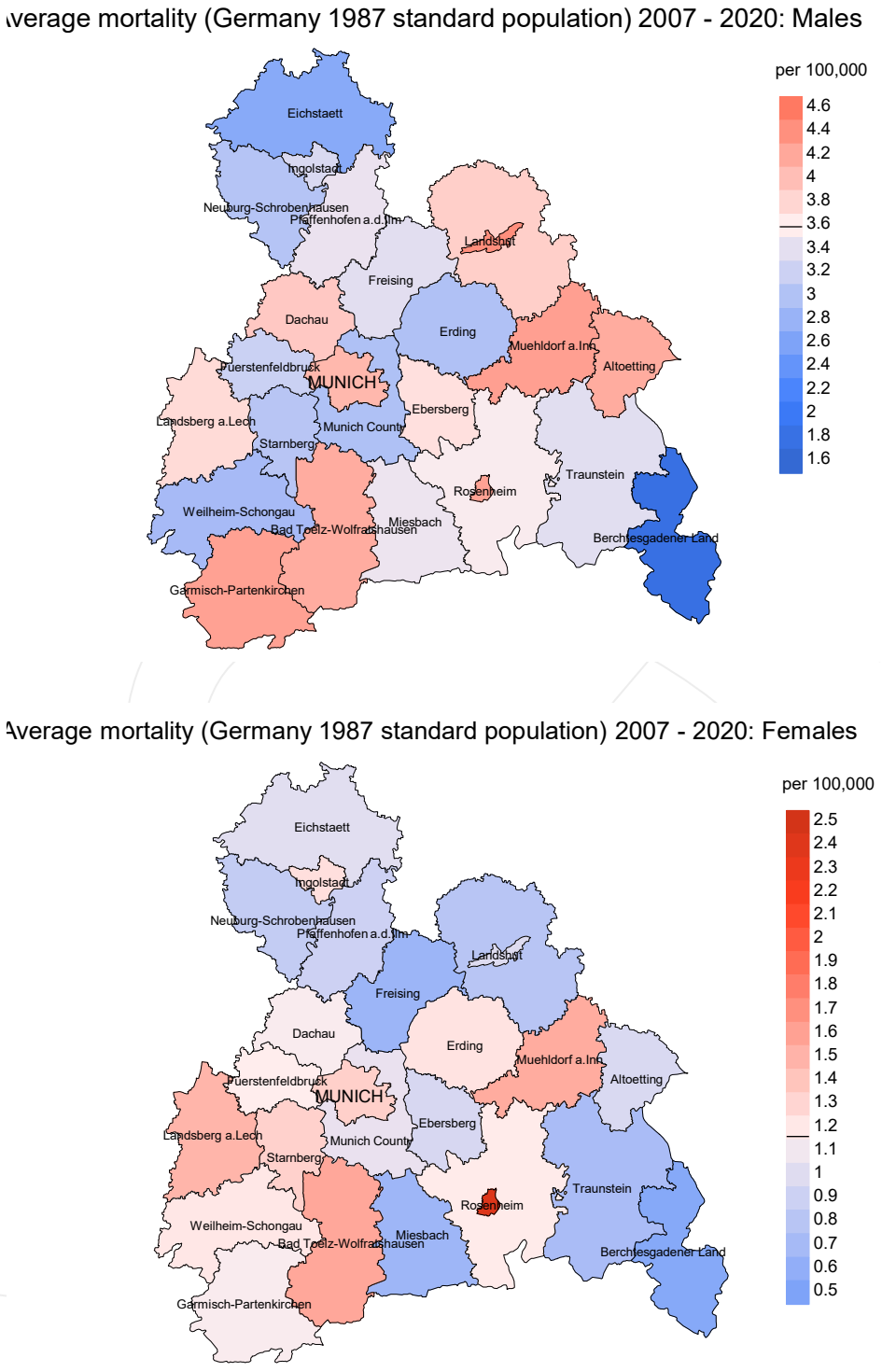

Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 3.6/100,000 WS N=1,285, females 1.2/100,000 WS N=519).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 12 women died from oral region cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 1.0/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.4 and 2.0/100,000.

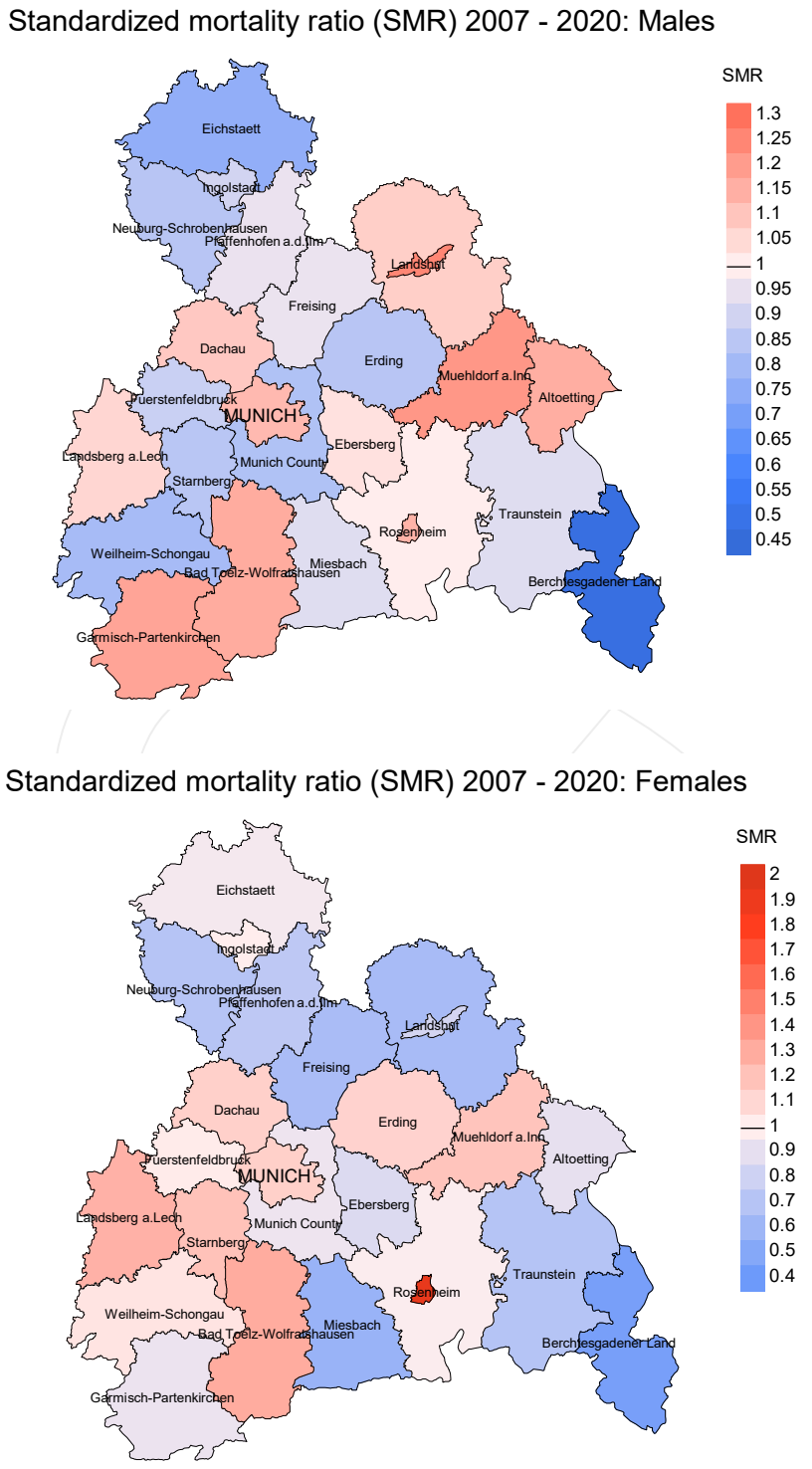

Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=1,285, females N=519).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2020 a total of 12 women died from oral region cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.86. Though, the value of this parameter may vary with an underlying probability of 99% between 0.35 and 1.72, and is therefore not statistically striking.

Statistical Notes

In all tables and figures the respective reference values should be carefully considered. The incidence rates include diagnoses (with multiple primary), and death certificate only (DCO) cases, where applicable. For mortality statistics patients, diagnoses and progressive course of disease are presented. In the calculations, all courses of disease are considered whereby progressions occurred and/or death certificate identified progressive cancers were ascertained. Additionally there are three groups of disease course to consider:

1. **All multiple primaries included**

   The mortality statistic describes the tumor-specific death, independent of any malignancy. The patient perspective, induced secondary malignancies, and the problem of multiple malignancies from the same primary tumor all have reasons for their inclusion.

2. **First singular primary** (no information about other prior or synchronous malignancy)

   The mortality statistic describes the cancer-related death for patients who have no therapeutic restrictions due to a previous or synchronous cancer. These statistics are comparable to studies that have exclusion criteria based on a second malignancy.

3. **Single primary** (no information about other prior, syn- or metachronous malignancy)

   The mortality statistic describes the tumor-specific death that occurs without any impact through secondary primaries, earlier, synchronous, later or induced. Precisely the difference between disease group 1 and 2 highlight the magnitude of the problem of secondary malignancies.

For this reason differences appear concerning official mono-causal mortality statistics. To judge the maximum deviation, 2 further tables are presented. In the first table the distribution of secondary malignancies before, at or after the described cancer are shown, that could be an alternative cause of death. In the second table, the age-specific mortality rates for all courses of disease, without designation of secondary malignancies are shown.

A previously minimally acknowledged statistic is the **age at death**, which allows for a good assessment of the quality of classification of the apparent tumor-specific death. For assumed tumor-independent deaths, the age of death should be estimated from the age of diagnosis and the normal life expectancy, whereas tumor-dependent deaths can be estimated from the age of diagnosis plus the average tumor-specific life expectancy. The comparison of different tumors demonstrates this association, if the causes of cancer and the competing cause of death are independent of each other (e.g. breast and colon versus head&neck and lung).

The ratio of mortality and incidence (mortality-to-incidence ratio, **MIR**, **MI-Index**) is a statistical index that allows for the evaluation of the quality of data. For diseases with poor prognoses, comparable values are obtained from all age groups, because to a large extent, the numerator and denominator contain the same cases. For tumors with a good prognosis, increasing and decreasing incidence and age-specific differences in prognosis can more strongly alter the MIR. Additionally, attention should be paid to the confidence intervals where fewer cases are reported.

The complexity of problems identified here emphasizes the importance of relative survival data for the appropriate analysis of long term results.

As a measurement of the burden of disease, the number of potential life years loss due to premature deaths in a cohort can be calculated (**PYLL**, potential years of life lost, standardized per 100,000 persons or per European standard) as well as the average loss of life years per individual (**AYLL**, average years of life lost). Depending upon the analytic aim (health economy, prevention, health care research) different methods exist for the generation of these measurements. In the results presented here, the age for a premature death is considered to be before 70 years, according to the guidelines of the OECD and the WHO (as seen in the abbreviation PYLL-70 or AYLL-70).

Shortcuts

MCR	Munich Cancer Registry (Tumorregister München)
GEKID	Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)
SEER	Surveillance, Epidemiology, and End Results (USA)
DCO	Death certificate only
BRD-S	German (FRG) standard population
ES	European standard population (old)
WS	World standard population
SIR	Standardized incidence ratio
CI	Confidence interval
EAR	Excess absolute risk = excess cancer cases (O - E) per 10,000 person-years
PYLL-70	Potential years of life lost prior to age 70 given a person dies before that age
AYLL-70	Average years of life lost prior to age 70 given a person dies before that age
SMR	Standardized mortality ratio
MI-index	Ratio of mortality to incidence, MIR
FRG	Federal Republic of Germany

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